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EDITORIAL.

The agricultural research officer cannot afford to consider the particular problem on which he is working as an isolated investigation unrelated to similar problems engaging the attention of scientists in other countries. Although the local conditions may be peculiar—this is indeed the reason that research on the same subject must be duplicated in different countries—there remain generalities which are common to all. Furthermore, most investigations in a Department of Agriculture cannot be confined to "pure research"; they must be approached, or more frequently, they must converge, to a consideration of the practical application of results.

In these days of rapid advance in agricultural science it is therefore of first importance that due consideration be given to the methods of agriculture employed in other countries, with the object of comparison and the hope that where applicable, valuable common practices in one country may become innovations in another country.

In technical research, the investigator is able to keep in touch with work of a similar nature in other countries, mainly by means of exchange publications. For instance, in exchange for the regular supply of all issues of *The Malayan Agricultural Journal*, the Malayan Department of Agriculture receives agricultural publications from 215 sources.

Similar information on the practice of agriculture in various countries is less up-to-date and less general than that of a scientific nature. The Department of Agriculture has advanced a considerable way towards comparing the systems of agriculture of the more important crops grown in this country with the methods obtaining in other countries, and much of this information has been published from time to time.

In the present number, our two main articles concern the copra industry in the Solomon Islands, and the rice industry in Burma. The former article is compiled by Mr. H. T. Pagden who, after four years of research work in Malaya, spent two years in the Solomon Islands. In connexion with problems concerning the coconut industry we would also draw attention to a new publication of the Department reviewed in this number, in which Mr. F. C. Cooke, Officer-in-Charge of Copra Investigations, reports on a visit to the Philippines for the purpose of studying the conditions of the coconut industry in that country. It

will be remembered that previously Mr. Cooke reported on the coconut industry in Ceylon*. We have, therefore, comprehensive accounts of this industry in three important countries of production to compare with the methods obtaining in Malaya.

Our second article in this number is by Mr. Parker, Manager of the Government Rice Mill at Bagan Serai, Perak. Mr. Parker is a practical miller, and in his visit to Burma he was chiefly concerned with the practical aspects of the sale and transport of padi to the mill, the milling quality of the padi and the commercial aspect of the method of milling employed. The success attending the efforts of the Department of Agriculture in Burma to increase the area cultivated with selected varieties of padi suitable for milling, and the increased profit accruing to the cultivator by the cultivation of such improved seed is of particular value, and finds its counterpart in the work of our Department of Agriculture in the main padi-growing areas of this country. The comparison between Burma and Malaya shews that work in the latter country is proceeding on right lines, and although less advanced than in Burma, is already proving of financial benefit to the growers, who not only obtain heavier crops by the use of selected seed, but are offered a premium for their crop by the local millers.

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Original Articles.

THE RICE INDUSTRY OF BURMA*

BY

H. PARKER,

Manager, Government Rice Mill, Bagan Serai, Perak.

On the assumption that the world's area under rice is in the neighbourhood of 200 million acres, the area of 12½ million acres in Burma is equivalent to about 6 per cent. of the total, but, on account of her surplus of approximately 5 cwts. per head of population, she exports about 45 per cent. of the total rice that enters international trade. Although Burma holds a dominant position as regards quantity, she has within recent years lost some of her markets, particularly in Europe, to higher grade rices produced in Italy and America, while at the same time she is experiencing increased competition from Indo-China and Siam in eastern markets.

Rice is by far the most important crop in Burma, covering 75 per cent. of the cultivated area. It is on the rice crop that the prosperity of the country very largely depends, as 70 per cent. of the population are engaged in rice cultivation and trade, and it is the main source of revenue to Government.

Embankments and Canals.

In Lower Burma embankments are necessary in some tracts for the protection of crop against floods, and canals are required either for communication or for drainage purposes.

Climate.

Burma has essentially a monsoon climate and is entirely dependent on the South-West Monsoon for its rainfall. The rainy season lasts from about the middle of May till the middle of October. The remainder of the year is almost rainless; this enables the cultivator to harvest his padi and store it in a good dry condition.

Rice-growing Areas.

The main physical factors that have determined the distribution of padi cultivation in Burma are rainfall and soil, as it is a crop which requires a large amount of water, and the soil and subsoil must be of sufficiently close texture to enable water to be kept on the fields to a depth of 3 to 6 inches throughout the growing season.

* Report of a visit to Burma in November 1934, to investigate particularly the rice-milling industry in that country.

Over 80 per cent. of the crop is produced in Lower Burma where the crop is almost entirely dependent on rainfall, and it is from Lower Burma that the whole of the exportable surplus comes.

Classification of Grain.

A system of classification which takes into account grain characteristics has been adopted by the Department of Agriculture. The rices have been divided into five main groups as shewn below, with the markets to which the rice is sold.

	Classification.	*Main Markets.*
A.	Emata	Europe and India.
B.	Letywezin	All eastern markets.
C.	Ngasein	Europe, Cuba and Straits.
D.	Midon	Europe, Straits and local consumption.
E.	Byat	Europe and India.

Cultivation.

Cultivation commences as soon as the first showers of the monsoon have softened the land sufficiently to enable the plough to penetrate the soil. As this requires in Lower Burma 4 to 6 inches of rain spread over a period of 7 to 10 days, ploughing usually commences about the end of May or the beginning of June. The general practice is to transplant padi, but in some tracts where labour is scarce, or in cases where the crop cannot be planted in time, the seed is sown by hand. Transplanting in Lower Burma is general by the middle of July and is usually over by the middle of August, except in late tracts where it is necessary to wait until the August floods—which are common in low-lying areas—have subsided.

Harvesting.

At the end of the rainy season in Lower Burma, stormy weather with high winds, which may lay the crop flat in all directions, is often experienced. To prevent this and to facilitate reaping, it is a common practice when the water in the fields begins to dry up, to flatten out the crop in one direction with a long bamboo pole 12 to 14 feet in length. Reaping is always done by hand using the same method as in Malaya.

Threshing.

The threshing floor is generally a padi field scraped smooth, and plastered over with cattle dung and clay to give a hard and smooth surface. The threshing is done by bullocks treading on the grain; the process is slow, the out-turn of grain per pair of bullocks being from 350 to 400 lbs. in a nine-hour day. It is impossible to prevent the grain thus threshed becoming mixed with mud, bits of straw and animal excreta; on this account it has to be screened and winnowed before it is sent to the mill or sold to a broker.

When the crop is winnowed, the grain is heaped up on the threshing floor, and, after the cultivator has laid aside his requirements to provide food until the following harvest, and to pay his rent and the wages of his labourers, the surplus is generally sold off the threshing floor to padi dealers.

Yield.

The average yield per acre in Burma is similar to that of Siam, *i.e.* about 1,500 lbs. or 270 Malayan gantangs. The aim in Burma is not only to produce high yields but also uniform grain—uniform not only in its behaviour in the field but in its physical characteristics on milling, and its appearance.

Cost of Cultivation.

It was very difficult to obtain accurate information on the costs of cultivation; cultivators keep no accounts, and some work their holdings themselves with their own cattle and the help of their families, while others engage labourers and hire cattle.

Disposal of the Crop.

The padi market for the new crop opens about the middle of December and the greater part of the marketable surplus is sold by the actual growers within the next four months. Land-owners, who always collect rents and frequently debts from their tenants in kind, traders and speculators store considerable quantities in godowns along the main railway lines and waterways till later in the year in the hope of a rise in price.

The bulk of the crop is sold off the threshing floor to middlemen, usually referred to as jungle brokers, who travel from village to village buying padi to sell later in the year to big mills in Rangoon or small millers in the districts. The writer understands that it is quite a common sight, during the months of February and March, to see large heaps of padi, often amounting to 1,000 to 2,000 tons, at collecting points awaiting transport or a rise in the market.

Measuring Baskets.

Padi is sold by the 100 baskets. The standard Government basket is 9 gallons capacity but its use is not enforced in private transactions. The village basket varies from district to district from about $8\frac{1}{2}$ to 9 gallons capacity holding from 44 to 54 lbs. of padi. The size of the basket may vary in some villages according to the use that is to be made of it. A small-sized basket is used by the cultivator for paying wages, and, if possible, debts which are to be paid in kind, while the land-owner insists on bringing his own basket to collect rents and debts from the tenants. As might be expected, this variability in the size of the basket is exploited a good deal by jungle brokers buying padi, and, as far as could be ascertained, there is no protection for the cultivator.

Method of Purchase in Big Mills.

The big millers take delivery of padi either at a railway siding or river jetty, but the miller buys on a weight-cum-measurement system. The miller's basket is the Government 9 gallon measure and the basket weight is taken into consideration in paying for the consignment, but he fixes a basic weight of 46 lbs. per basket; for padi weighing over 46 lbs. he pays a small premium, and the price is reduced if it is under this weight. A premium of from Rs. 5 to Rs. 20 per 100 baskets is paid by the millers for padi grown from seed supplied by the Department of Agriculture, but only when the crop is taken direct to the mill. It will thus be seen that very few of the actual cultivators obtain a premium, the person who does obtain it being the large broker or landlord, because the cultivators have little, if any, stocks left for disposal after paying rent, labour charges, and other dues. It is interesting to note that landlords, including chettiars, are taking active interest in the Department of Agriculture seed; many of them not only buy seed for supply to their tenants, but they insist that it should be grown and that rent and other liabilities due to them be paid in the form of padi from such seed.

Padi Godowns.

The method of storage in the mills is entirely different from that practised in Malaya; the padi is stored in bulk in godowns, the floors of which are covered with a flooring of plaited bamboo, a commodity which is much cheaper in Burma than in Malaya.

This type of floor seems to be very suitable for Burma because the mills do not store padi for long periods.

Pure Padi for Sale.

The disposable surplus of pure padi was estimated to amount to 3,409,470 baskets in 1934, and particulars as to where it was available were supplied to all Chambers of Commerce and rice firms by the Department of Agriculture. The result was that a demand was created and the cultivators found that a much readier sale could be obtained for padi which was freed from red grains, and of uniform size. The Department of Agriculture co-operate with the large millers to ensure adequate supplies of reliable padi of uniform quality and type, knowing that there is always a market for a really good product if continuity of supply and quality can be relied on, and assuming that prices, having regard to quality, are competitive.

Milling.

The rice mills in Burma may be divided into two classes:—

(1) The large mills at the export towns owned by Europeans, Chinese and Indians, who mill entirely for the export trade; there are about 44 of these mills in Rangoon and suburbs. The output of the large mills is from 1,000 to 1,500 tons of padi per mill per day of 24 hours.

(2) The small mills in the districts owned mainly by Chinese, Indians and Burmese, who may sell their rice to export merchants in the ports, or to merchants elsewhere for local consumption. A large number of these small mills, however, mill for hire only, the rice being used for local consumption; there are about 400 of these in Lower Burma. The rice mills are chiefly of British, German, and local make and the method of milling similar to that of Malaya.

Qualities of Rice.

For the European markets, No. 1, No. 2 and No. 3 are milled. No. 1 is the highest quality of rice milled and polished in Burma from specially selected quantities of grain of uniform size, shape and hardness. It contains less than 15 per cent. broken grains and is milled to give it a fine polish. No. 2 is also milled from specially selected grains usually of the same type but is not generally so bold as No. 1 and it contains up to 20 per cent. of broken grain. No. 3 is much the same as No. 2 but has not been polished to the same extent. For eastern markets, Big Mills Specials, Small Mills Specials, and Straits Quality are the main grades exported. The Big Mills Specials is the lowest grade exported and contains up to 42 per cent. broken rice. It is in demand mainly in India and the Netherlands Indies. Small Mills Specials is milled from a better quality of grain and contains about 40 per cent. broken rice; it is sold mostly in India. Straits Quality is of better quality having only about 37 per cent. broken grain. It is, as its name suggests, exported mainly to Malaya for the Chinese population, and is also exported to Cuba.

Quite a considerable quantity of "Loonzain" or "Cargo Rice" is milled. It is really shelled rice containing from 2 to 5 per cent. padi and 10 per cent. broken rice. As the husk is 20 per cent. of the weight of the full padi grains, this weight is saved in shipment when it is sent to Europe to be milled up to the required degree of finished white and highly polished rice. Parboiled rice constitutes about 15 per cent. of the total exports and is the most profitable rice to mill having the following advantages: the grain is shelled with the greatest possible ease, being toughened by the boiling process; it can be subjected to severe milling without loss from breakage; and it can be stored for a longer period than white rice. The demand for this rice comes from India, Ceylon, and Malaya for plantation labourers.

As stated previously, the method of milling in Burma is much the same as in Malaya, but in comparison it is much more simple for the miller in Burma on account of the standard type of padi. Rice is sold on sample and certain standards, which are known and accepted all over the world; the specifications are printed and published from time to time by Associations of Millers and Exporters, and the miller is able to buy such large quantities of padi of regular uniform grain that he can repeat or mill the same standard of rice whenever he receives an order.

The writer visited about 100 mills in Burma with outputs ranging from 8 to 100 bags of rice per hour. The mills producing the best rice in proportion to the quality of padi were found to be those with outputs ranging from 8 to 30 bags per hour, and mostly under European or Chinese supervision. The machinery in these mills is of modern type, and mostly of German manufacture. It was the custom in past years in Burma to erect large mills capable of dealing with 700 to 1,000 tons of padi per day per mill. As such mills increased in number, it manifestly became more difficult to ensure supplies of regular uniform padi, with the result that in certain cases the quality of the product suffered. Of late years the tendency has been to erect mills of such moderate capacity as to ensure a steady supply of a uniform variety of padi, to enable the miller to produce the standard rice required. It is unnecessary to make comparisons between the work which has comparatively recently been commenced in Malaya, and what has been accomplished over a period of years by the Department of Agriculture in Burma, with its 12,000 acres of land under experiment stations. These experiment stations have been organized over a period of years, for pure line selection, for hybridization, and for seed-growing, and the results have justified the expenditure of much time and money.

Rice grown in Malaya connot, for many years to come, command the same price as selected Siam or Burma rice, but it can attain a very much higher standard than it has so far reached. Much of the objection which exists to Malayan rice results from using mixed seed. Not only is the outward appearance of the white rice unsatisfactory, on account of the lack of grain uniformity, but the difference in resistance of one variety compared with that of another tends to breakage in milling. Some varieties have a white kernel throughout, while the kernel of others is surrounded by a red cuticle; all the varieties lack uniformity in size, shape and hardness, which causes excessive breakage in milling. Finished rice, to command a good price, must not only be uniform and of good colour, but it must be free, as far as possible, from broken grains; when this aim is achieved the miller will receive a better price for his rice, and be in a position to pay the cultivator more for his padi.

The writer was very interested and impressed by the method of seed distribution in Burma developed by the Department of Agriculture, the success of which has been considerably helped by close collaboration with the leading rice millers, and the paying of premiums. There are about 122 Seed Farms; these farms are divided into two classes—Major and Minor Farms, and the storage accommodation is provided by the tenants under the supervision of Agricultural Assistants, and all the seed produced every year is tested for purity and quality before it is distributed for seed purposes. A rebate of up to 20 per cent. is given on the rent when seed of over 99 per cent. purity is produced, and the seed has to be stored by the tenants until it is required for distribution by the Department of Agriculture. It was authoritatively stated that some of the principal mills which bought quantities of these improved strains were able to pay premiums of

Rs. 20 or more per 100 baskets for the grain. The cultivators obtain this seed from Agricultural Assistants in each district and pay for it in cash at a fixed rate, although in special cases seed may be advanced on credit on the completion of a security bond.

Acknowledgments.

The writer takes this opportunity of acknowledging the courtesy and assistance shewn to him during his visit to Burma by the Chief Secretary, the Director of Agriculture and the Deputy Director of Agriculture. Such assistance, and the facilities so readily placed at his disposal, were of great value in prosecuting enquiries regarding the rice industry in Burma.

THE COPRA INDUSTRY OF THE BRITISH SOLOMON ISLANDS

BY

H. T. PAGDEN,*

Rice Research Entomologist.

The British Solomon Islands Protectorate lies between the 5th and 12th parallels of South latitude and extends for some 900 miles from north-west to south-east. There are six large islands and numerous small ones. The islands are densely wooded and some of them rise to a considerable height, Guadalcanal having one peak of over 8,000 feet and the small island of Kolombangara, some 15 miles in diameter and almost circular, rising to 5,600 feet. Peaks of 3,000 feet are not uncommon and all are densely wooded to the summit. Many of the islands have fringing coral reefs and there is a barrier reef along the north-eastern coast of New Georgia and the eastern coast of the adjoining island of Vángunu, and on this coral-islets rise to 100 feet or more. A similar, but less impressive, reef runs along the opposite coast of New Georgia. These two reefs each enclose extensive lagoons, the latter the Roviana Lagoon, the former the very extensive Márovo Lagoon, perhaps one of the most beautiful places in the world. Some 180 miles north of the main chain of islands lies the large atoll of Ontong Java, also known as Lord Howe Atoll, the inhabitants of which are Polynesians, their language being said to resemble Maori. Polynesians are also found in Sikaiana, Tikopia at the extreme south-east of the group, Rennell and Bellona Islands. The remainder of the population consists of Melanesians, of whom there are some 89,500, the Polynesians numbering only about 3,800. The Melanesians vary in colour from ebony black to chocolate and have fuzzy hair, the darkest natives being those from the Western Solomons, Choiseul and the Shortland group, also New Georgia and the surrounding islands.

The headquarters of the Government are situated on the small island of Tulagi, some 3 miles in circumference, lying off the south coast of Nggela or Florida Island.

Travelling from one island to another is accomplished in small vessels, which are usually of about 10 tons, though some are smaller and others are as much as 30 tons. Most of these vessels are equipped with auxiliary engines. There are also two vessels of about 80 tons each, steel built and equipped with diesel engines.

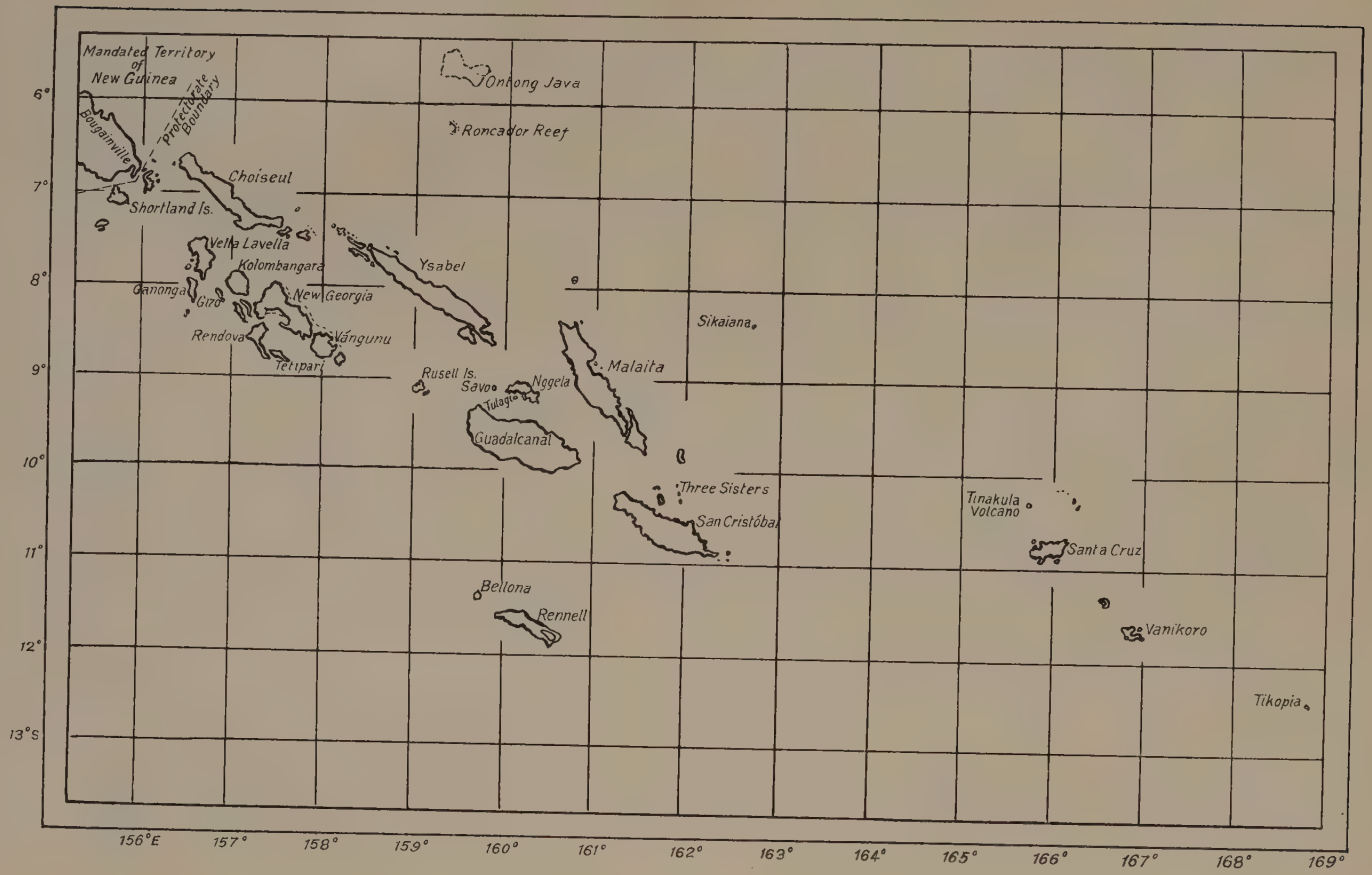
Climate.

The rainfall is generally distributed throughout the year, with rather heavier precipitation from October to March. August is generally the driest month in Tulagi (Government headquarters).

Except for a rather dry zone on Guadalcanal, where some of the poorest coconut estates are situated, the rainfall in the planted areas ranges from about

* The author was seconded to the Solomon Islands, as Senior Entomologist, for a period of two years. These notes were compiled at the termination of this period.

BRITISH SOLOMON ISLANDS PROTECTORATE



85 to 150 inches per annum. In the dry zone mentioned as little as 45 inches has been recorded on one estate. Three Sisters, off the coast of San Cristóbal, had an average of 190.6 inches over the 19 years from 1916 to 1934, with a maximum of 262.4 in 1934 and a minimum of 113.3 in 1920. The writer never visited these islands but understands that the soil is well drained and able to cope with this very heavy precipitation.

The best yielding coconut estates are situated in the Russell Islands and have a rainfall in the neighbourhood of 120 inches per annum.

The humidity in Tulagi averages 82 per cent. and varies from 75 to 87 per cent.

The Solomon Islands lie outside the hurricane zone but high winds and bad storms are sometimes experienced, usually during the months of October to March.

A south-east wind blows from about April to September and a north-west wind from October or November to March. The latter period is generally looked on as the rainy season; heavy rain and electric storms are frequent, and the sea is generally more disturbed than during the south-east season.

The writer has never heard complaints of damage to extensive areas being caused by wind but has several times encountered cases of isolated palms which had broken off at about 8 feet from the ground, though no cause of weakness at the point of fracture could be detected.

One active volcano, Tinakula, lies to the north of Santa Cruz, and the island of Savo, about 20 miles west of Tulagi, is said to have been in eruption within living memory. Fumaroles are found on this island and there is an extensive area of fumaroles and solfataras on Vella Lavella Island.

Earthquakes are not infrequent and may be severe.

Soils.

Both igneous and coralline rocks are found and coral outcrops occur on some islands (1). The writer has seen such outcrops several hundred feet above sea level and several miles inland. In the Russell group high coral cliffs are found and even more remarkable cliffs are found round New Georgia Island, many of them being part of the barrier reef surrounding the island and rising to as much as 200 feet.

In an article on soils in the Protectorate, Lever (2) gives tables of analyses from three localities, the first two being from the Imperial Bureau of Soil Science, the third from the Waite Institute, Adelaide. They are reproduced here.

Comment is made (see Table I) on the high amount of clay compared with silt, and on the low value for water-soluble salts and acid-soluble CaO, K and P_2O_5. Iron and manganese are high; nitrogen, organic matter and pH value are all satisfactory.

It is suggested that artificial manuring would not be satisfactory on account of the large amount of clay, nor would green manuring or liming be likely to prove profitable.

From an estate on Guadalcanal Island three samples were taken from good and poor yielding areas and from an unplanted area (see Table II).

Table I.
Analysis of four Samples of Soil from Malaita Island.

Taken to a depth of two feet.

	No. 1	No. 2	No. 3	No. 4
	per cent.	per cent.	per cent.	per cent.
Silt ...	13.6	5.8	5.8	7.8
Clay ...	61.0	75.1	73.3	83.3
CaO soluble in HCl ...	0.30	—	0.22	0.21
K do. ...	0.04	—	0.03	0.06
P_2O_5 do. ...	0.24	—	0.30	0.41
P_2O_5 available ...	0.003	—	—	—
Nitrogen ...	0.22*			
Organic Matter ...	3.64*			
pH value ...	6.9	6.8	6.7	6.5

* Top soil only.

Table II.
Analysis of Three Soils from Guadalcanal Island.

	Poor		Good		Unplanted	
	Top Soil	Soil at 3½ ft.	Top Soil	Soil at 3½ ft.	Top Soil	Soil at 3½ ft.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Coarse sand ...	6.7	30.8	69.3	88.9	4.6	6.0
Clay ...	35.7	34.2	10.2	5.7	36.6	31.5
CaO soluble in HCl	1.42		0.86		1.01	
P_2O_5 soluble in HCl	0.19		0.22		0.17	
P_2O_5 available ...	0.04		0.10		0.02	
K do. ...	0.16		0.05		0.15	
Na do. ...	0.01		0.01		0.02	
Nitrogen ...	0.32		0.12		0.18	
Organic Matter ...	9.82		3.82		11.44†	
pH value ...	6.9	6.8	6.9	6.8	6.5	6.7

† Figure high due to free carbon from burnt grass.

The author remarks, concerning these analyses, that the soil with an average of 79.1 per cent. coarse sand is likely to be more suitable for coconuts than that with an average of only 18.7 per cent., but that both soils should be good provided that the water supply is adequate. Chemically, the phosphate deficiency is not great, and exchangeable potash, nitrogen and organic matter are considered satisfactory.

The third locality has a soil of quite a different type, but no mechanical analysis is given. The chemical analysis is shown below.

Table III.
Analysis of Soil from Russell Islands.

Samples taken at depth of 1 ft. 2 ft. and 3 ft.

	1 foot	2 feet	3 feet
	per cent.	per cent.	per cent.
Organic carbon ...	1.82	1.36	1.20
Nitrogen ...	0.16	0.13	0.12
K soluble in HCl ...	0.04	0.03	0.03
P_2O_5 do. ...	0.08	0.11	0.11
pH value	5.5 to 6 in all cases.		

While nitrogen and phosphoric acid are fairly satisfactory, potash is very low and the soil is rather on the acid side. Nevertheless, the estate from which the samples were taken is a consistently high-yielding property.

To the foregoing some brief notes on the general appearance of the soils, as they struck one who is not a specialist, may be of interest.

The estates seen on Malaita Island may be characterized as consisting of very heavy clay, which, in many places, is often in a waterlogged condition. On Guadalcanal the soil varies from a sandy nature with some basalt and, in places, alluvium and gravel, to clayey loams with some coral outcrops. In the Russell Islands the soil appears to be a rich chocolate loam with coral outcrops. One of the estates on Kolombangara Island has soil varying from yellow to red, with a certain amount of black iron sand on the foreshore. Another estate on the same island has the whole foreshore of a similar sand, but extending for a considerable distance inland where there is a coral reef lying just beneath the surface indicating a previous shoreline; the rest of the estate has a soil of clayey nature, as is indicated by its generally waterlogged condition, in spite of numerous drains. Further round to the south-east on the same island there is an estate with many

large ironstone boulders embedded in the soil, and there are also hillocks with much broken weathered coral, the appearance of the coral suggesting that it has been subjected to volcanic action, and this is probable as the island is an extinct volcano and there are several small crater-like cavities on the estate in question.

An estate on the north-east end of Rendova Island is situated partly on the mainland and partly on small coral islets which rise from the fringing reef; this estate is of particular interest in that the palms on the islets are growing on almost pure coral with hardly any soil. On the only one of these islets which was visited by the writer the crop was very good indeed, the crowns of the palms being crowded with nuts. On one palm 126 nuts were counted from the ground, using field glasses, and all were nearly fully-developed and nearing ripeness; the number must have been greater than this as many nuts were hidden by others below. The region where this estate is situated is much subject to earthquakes of a violent nature; apparently the palms do not suffer in any way from these disturbances.

Another remarkable estate is a small privately-owned holding of only 20 acres, not more than about 18 acres being planted with palms. This estate is situated on an extraordinarily hard shelly limestone, descending for at least 12 feet and with only a few inches of soil on the surface; in spite of these seemingly unsuitable conditions the palms yield the astonishing crop of more than a ton of copra per acre, 20 tons being regularly harvested annually from the planted area. The planting is at 40 feet spacing on the square.

Lying to the east of New Georgia Island is the extensive Márovo Lagoon, in which are hundreds of small coral islets, most of which carry their quota of coconut palms; many of them have been planted and are worked by white people. The area is remarkable for the fact that the palms are growing on almost pure coral rock and most of them are bearing well, though some have fallen off in production recently. In one case 12 cwts. per acre have been harvested annually for 20 years. There seems to be scarcely any soil in the form usually understood by this term. Similar conditions are found elsewhere to a less extent on the reef-islands round some of the large islands.

On the small island of Savo, nearly circular and some 18 miles in circumference, there are palms growing and bearing well at over 1,000 feet near the lip of the old crater, and palms bearing good crops were seen at about 2,000 feet on Kolombangara Island.

On Vella Lavella Island the soil appears to be a sandy loam; most of it is undoubtedly of volcanic origin and there is still a considerable amount of thermal activity on the eastern side of the island. One estate visited had a coral foreshore followed by an abrupt rise of about 80 feet to a plateau, where the soil appeared to be a rich sandy loam varying in colour from red-brown to dark chocolate, with a considerable amount of well-weathered coral at a depth of 3 to 4 feet. Though the conditions seemed to be ideal for coconuts, and the rainfall was within the limits of that found on the best estates in the Protectorate, the estate was practically barren over the whole of its 500 acres. Further along the

coast in both directions the plantations were bearing moderate to good crops, though one, where there was a good deal of black iron sand, was on the poor side.

The most consistently good-yielding estates are those situated in the Russell Islands, where crops range from 10 to 15 cwts. of copra per acre, one estate giving a crop of the latter figure over the whole area of some 3,000 acres.

The Plantation Coconut Industry.

The plantation coconut industry in the Solomon Islands has existed since the early part of the present century. Previously one or two traders were established in the Islands and these owned coconut groves and did some trade in copra.

At the present time there are three main coconut planting companies operating in the Islands. Plantations vary from about 300 to 3,000 acres, the largest individual estate being in the Russell Islands.

The largest coconut planting company owns estates on Guadalcanal Island, in the Russell Islands (Banika and Pavuvu Island), on Kolombangara Island, Rendova Island and on various smaller islands and islets.

Another company has its largest estate in the Russell Islands. It also owns properties on Malaita Island, and has recently acquired several estates on Guadalcanal Island.

The third company has its principal properties on Guadalcanal and Shortland Island, and also has a large estate on Montgomery or Tetipari Island.

A certain number of privately-owned estates is found in the various islands, some being quite small, about 20 acres, while others are as much as 500 acres.

In addition, copra is purchased by traders from native groves.

Methods of Cultivation.

The system of coconut cultivation practised in Malaya finds no counterpart in the Solomon Islands. In the latter country, soil cultivation is not general, and although weeding is carried out in some instances, in many cases reliance is placed on the use of cattle to keep the undergrowth in check. Weed growth, however, is rapid, rendering control by grazing cattle inadequate and resulting in many instances in a fairly dense undergrowth, which may attain a height of six feet or more.

Recently, attempts at surface cultivation with rotary hoes have been made; considerable labour has been expended in removing large boulders, partially embedded in the soil, before the hoes could be used, but many large boulders were encountered beneath the surface when the hoes were put into action. It is too early yet to say whether any beneficial results will accrue; having had no previous cultivation the roots of the palms are very near the surface and were cut by the hoe and it would seem likely that an initial set-back may occur before any improvement can be seen.

Perhaps the commonest weeds are *Sida rhombifolia*, known locally as Paddy's Lucerne (better known elsewhere as Queensland Hemp), a large leaved shrubby *Ficus* (*sensu lato*), *Mimosa pudica*, which grows very rank, and the grasses

Chrysopogon aciculatum, *Stenotaphrum* and *Paspalum conjugatum*, while on certain estates ferns and sedges are noticeable amongst the undergrowth. One plantation, more or less abandoned, was almost choked with *Stachytarpheta*, locally known as blue rat-tail. *Lalang* grass also occurs, and where this or *Chrysopogon* is found the palms are generally poor or almost barren. The latter grass will generally suppress any low-growing cover and most other grasses. In some cases, attempts have been made to establish *Desmodium triflorum*, a low growing clover, but where *Chrysopogon* occurs this has always failed. There is, however, a small creeping grass, somewhat like a minute *P. conjugatum*, which seems to be able to suppress *Chrysopogon*, and this grass may in turn be suppressed by *Desmodium*. The grass was first seen by the writer on Bilua Mission Station, Vella Lavella Island. It was brought from Choiseul Island and quickly established itself in the place in question, suppressing the pre-existing growth of *Chrysopogon*. All attempts at establishing *Desmodium* had failed until that time but this plant soon followed the imported grass. The writer saw the place when covered with *Chrysopogon* and after the *Desmodium* had become established, but not in the intermediate stage.

Centrosema and *Pueraria* were planted in two small adjacent plots on one estate. *Pueraria* did not succeed against the existing growth, which was cut before sowing the cover, but the *Centrosema* overwhelmed any new growth which was put up by *Mimosa pudica* and *Sida rhombifolia*, the two plants previously present. No attempt was made to keep it away from the palms, however, and it ascended the trunks for a considerable distance. The ensuing damp conditions caused a superficial rot, and ants, *Pheidole megacephala* Mayr, tunnelled the tissue and nested.

Preparation of Copra.

The crop is collected from the ground, the nuts being split with an axe and the meat cut out with a knife and rammed into a bag in the field, the bags often remaining in the field for several hours before they are collected and taken to the dryer.

One or two estates dry in the half nut, usually in the husk, but sometimes after husking.

In all cases drying is far too rapid according to Malayan standards, the product usually leaving the dryer in 24 hours or less. The resulting product is of poor quality and is much subject to attack by fungus and insects, and may become slimy on storage. Frequently, copra which appears good when it comes out of the dryer deteriorates and becomes rubbery on storage. This is possibly due to a case-hardening due to too rapid drying.

Some estates have tried to improve the quality of their copra with some measure of success, but this is a recent development.

The New Guinea type of dryer is used to a considerable extent by one firm, who also use steam dryers on some of their estates. In the former type the meat is spread on trays carried on runners and arranged in tiers; hot gases from the

fires, invariably fuelled with jungle timber, pass through flues under the tiers of trays and a considerable temperature is reached. In the steam dryer, the steam is carried in pipes from the boilers and passed through the building. The product may be of rather a better quality than that usually obtained from the New Guinea dryer, but still leaves much to be desired, probably due to rapid drying.

Nearly all small estates use the smoke dryer, usually of a very inefficient type. Little attention is paid to draught exclusion and, as timber is used for firing, much smoke is produced and the copra is discoloured. In some cases shell and husk are used for firing, but there seems to be a rooted objection to this fuel, the reason given being that corrosion of the ironwork of the firebox is more rapid than with jungle timber. Perhaps this would not occur if dry shell alone were used, the husk, and a good deal of moisture, possibly being responsible for the trouble.

Recently a dryer known as the Buka dryer, the invention of a Mr. Drummond-Thompson of Kieta, Bougainville Island (Mandated Territory of New Guinea), and presumably named after Buka Plantations Ltd., has gained some measure of popularity, and one company was installing a number towards the end of 1934 and in early 1935. Briefly, the dryer consists of several tiers of wire mesh trays beneath which run two flues constructed of old 40 gallon crude oil drums riveted together end to end; the flues run parallel and are fired at opposite ends.

The writer saw a modification of this dryer on an estate on Malaita Island. Only one fire was used and the hot gases were passed along a flue which had two leads at right angles on either side, thus considerably increasing the heating area; the flues were constructed of crude oil drums as in the original but were enclosed in an outer casing pierced by a number of holes on the top, the idea being to conserve heat; the unit was well enclosed in an *attap* shed and the top ventilation could be controlled by raising or lowering the jack roof. At the commencement of drying the jack roof was raised to liberate moisture, but when the atmosphere became fairly dry it was lowered to increase the temperature. Drying was stated to take about 17 to 23 hours*.

Recently some attention has been paid to washing the fresh meat in sea-water before drying. The writer has not seen copra treated in this manner but it is claimed that the quality is much improved.

One remarkable dryer seen consisted of a large iron box, almost as large as an ordinary room, with a smoke vent at each corner. The fire was lighted in the box; husk and shell which had been stored in the dryer, and was thus fairly dry, being used for fuelling, and the half nuts, in the husk, stacked on top. Drying was carried out for about 24 hours, but usually a certain proportion of insufficiently dried half nuts were put back with the next charge.

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* A brief article on copra drying, with special reference to the Solomon Islands, appears in the *British Solomon Islands Agricultural Gazette*, Vol. 3, No. 2, April 1935.

Labour.

The labour usually employed is Malaita natives as these seem to be the best workers and the island is the most densely populated in the group. A regular trade is done in recruiting. The labourers are usually indentured for two years.

A few estates employ local labour from the neighbouring villages, but this is not always satisfactory, the attractions of the village and the fact that they are near home tending to make the labourers less manageable.

As far as the writer's recollection serves 30 to 50 labourers are considered sufficient for an estate of 1,000 acres. On some estates the proportion is greater, while on others it is considerably less than the figure quoted. In the Russell Islands, where the estates are generally cleaner than elsewhere, more labourers are employed than in the majority of cases. The least number of labourers to an estate was seen on a place of about 1,000 acres where only 14 natives were employed. The small private owner is generally quite unable to employ sufficient labour to run his estate efficiently.

Labourers were paid £1-0-0 (Australian) per mensem, but this is now reduced to 10s. (Aust.). Rations, clothing, a blanket, mosquito net, tobacco and quarters are all supplied free. Rations include: daily, 1 lb. rice and three ship's biscuits (flour and sharps may be supplied in place of biscuits); weekly, 2 x 12 ozs. tins meat, 1½ lbs. sugar, tea as required, 3 sticks of trade twist tobacco, and matches. These conditions apply to all boys, whether labourers or house boys.

Volume of Trade.

Exports of copra for three years are shewn in the following table.

Table IV.

Exports of Copra from the Solomon Islands.

Period	Copra Tons	Value £
1 April 1931 — 31 March 1932	21,209	137,843
1 April 1932 — 31 March 1933	22,256	153,426
1 April 1933 — 31 March 1934	21,119	70,379

A good deal of the copra produced is shipped to Australia. One company ships most of its product to Europe and some of the private owners have done the same by selling direct to agents.

A Norddeutscher Lloyd cargo vessel comes from Hong Kong *via* the Philippines and New Guinea about once a quarter.

In addition, copra boats call at irregular intervals, advice generally being received by wireless some time before their arrival.

Another firm, with headquarters in New Guinea, owning coconut estates and having a financial interest in others, runs its own vessels, supplementing the produce from its estates by purchases from other local producers.

References.

1. Lever. *British Solomon Islands Agricultural Gazette*, Vol. 1, No. 2, p. 3.
2. Lever. *British Solomon Islands Agricultural Gazette*. Vol. 3, No. 2, pp. 13-14.

Reviews.

The Coconut Industry of the Philippine Islands.

F. C. Cooke. 101 pp. 15 plates and 1 map. Special Bulletin, General Series No. 23 of Department of Agriculture, Straits Settlements and Federated Malay States, 1936. Price 50 cents Straits currency, post free.

The Philippine Islands are the most important exporters of coconut products in the world. The Islands are estimated to contain 1,480,000 acres under this crop, yielding 2,165 million nuts of which 388 million nuts are consumed within her borders and 643,000 tons of copra and oil (expressed in terms of copra) exported, worth 36 million dollars in Straits Settlements currency. Thus she exports 33 per cent. of world exports of coconut products, as compared with the Netherlands Indies 26 per cent., Ceylon 13 per cent., South Seas 10 per cent. and Malaya 8 per cent.

This great export trade is not only due to her enormous area under coconuts, but to the fact that the local consumption, though it appears great, is small in comparison with other coconut-producing countries. Thus, while the consumption per head in Ceylon is 250, and in Malaya 110, in the Philippines it is only 31.

These statistical data, extracted from the publication under review, not only emphasize the importance of the Philippines in the copra market, but justify the visit of the author to the Philippine Islands for the purpose of studying the conditions of the industry. Mr. Cooke, as Officer-in-Charge of Copra Investigations in Malaya, was well-qualified for this task, and the careful manner in which he has examined the situation in that country will be of value to his work in Malaya, while we venture to predict that the bulletin will be appreciated in other countries, and in the Philippines in particular, as an unbiased review of the situation by a trained observer.

The report is divided into nine sections, in the earlier of which the author gives an account of the conditions under which the crop is grown, systems of land-tenure, distribution of area, and the history of the growth of this important industry. Subsequent sections deal with methods of cultivation practised, and the manufacture and marketing of copra. This latter subject is particularly well illustrated to shew the types of kiln in general use and their method of construction, while the letter-press deals adequately with the quality of copra produced, its storage, grading and marketing.

While the bulk of the crop is exported as copra, the local production of coconut oil for export and for local consumption has increased considerably in the past few years, and efforts are being made to encourage the local consumption of copra by the production of cooking oil and edible fats, soap and desiccated coconut.

One section is devoted to a review of the economic conditions of the industry, in which consideration is given to capital value, cost of production, and the various methods adopted or under consideration by the Government, designed particularly with the object of making the livelihood of the grower more secure. The final section reviews the copra market in 1934 with special reference to the Philippines. It is largely an historical review of the tariff legislation in the United States of America and its effect on Philippine trade.

Throughout the report, emphasis is laid less on the present output of coconut products from the Philippines than on the greatly increased production, which may be expected to reach its peak in about 1940 when the large areas of coconuts at present immature come into production. In the latter year the exports are likely to reach 800,000 tons, equal to one-half of the total world trade in coconut products in 1933. The absorption of this increase will, the author states, largely depend on the attitude of the United States of America. If the United States of America cannot, or are unwilling to encourage the increased use of coconut oil in that country, there must be a gradual fall in world prices, possibly to a figure at which high-cost producers could no longer compete.

The author appears to consider that, while prices may be maintained by closer working agreements between countries, crop diversification appears to offer the best prospect of alleviating distress amongst small-holders in the coconut areas, not only in the Philippines, but elsewhere.

D. H. G.

A Dictionary of the Economic Products of the Malay Peninsula.

I. H. Burkill, M.A., F.L.S. *2402 pp. Crown Agents for the Colonies, 4, Millbank, London, S.W. 1, January, 1935. In two volumes price 30 shillings.*

This 2,400 page dictionary, which deals with 17,000 different subjects, has taken over ten years to compile and is a model of continuity of effort. As the title page shows, there are contributions by William Birtwistle (Officer-in-Charge, Fisheries Department, S.S. and F.M.S.), Frederick W. Foxworthy, Ph.D. (formerly Forest Research Officer, F.M.S.), J. B. Scrivenor, I.S.O., M.A., F.G.S. (formerly Director of the Geological Survey, F.M.S.) and J. G. Watson (Conservator of Forests, Malayan Forest Service) but ninety-four per cent. of the subject matter was contributed by the author himself.

Although this dictionary deals primarily with the vegetable products of the Malay Peninsula, it also contains information on both animal and mineral products common to Malaya.

The arrangement of the subject matter is such that only the most important information is brought to the front in the text, while marginal notes take the place of the usual sub-headings. In most of the articles comprising the dictionary, reference is made to other authors who have studied the particular subject in closer detail.

As the author states in the preface, the only satisfactory way of treating comprehensively so many widely different subjects is the assembly of the articles in alphabetical sequence; consequently, the subject matter has taken the form of a dictionary.

For the most part scientific names have been adopted for the headings. This is necessary in the case of the vegetable products since so many of the plants described in the work have no common names. There is, however, an index of nearly one hundred pages in which cross references are given of English, Malay and Sundanese (Dutch Indies) names which is available so that the layman will have no difficulty in finding any subject on which he requires information. Incidentally, the index is not altogether perfect, for instance, the *oil palm* is not indexed under this heading, but under the old title of African oil palm, which is now considered obsolete in the East Indies where it has become a most important plantation crop.

The Malay names of many of the plants and plant products have been corrected so far as possible after consulting the works of R. J. Wilkinson, C.M.G. and J. G .Watson on the subject. Some of the names, however, are still open to doubt and this is indicated in the text.

The dictionary was published on behalf of the Government of the Straits Settlements and Federated Malay States by the Crown Agents for the Colonies, and printed in Great Britain at the University Press, Oxford, in the latter's usual inimitable style and finish.

Mr. Burkill held the appointment of Director of Gardens in the Straits Settlements for a period of over twelve years during which time he obtained a wide and intimate knowledge of Malayan flora and this, combined with a botanical training, rendered him the most competent authority to undertake the writing of such an expansive work relating to the economic products of Malaya.

Although the dictionary has taken a decade to produce it will undoubtedly remain a standard work on the subject for many decades to come. At the price of only thirty shillings for the two volumes it is remarkably cheap and the popular way in which it is written will appeal to the layman just as much as it will satisfy the needs of the scientific workers in Malaya living among the flora and fauna described in this great work.

The author is to be congratulated on the comprehensiveness of the book, the general arrangement of the text and, last but not least, the clear and concise way in which each individual subject is treated. Anyone reading the work will

not fail to realize that Mr. Burkill during the ten years of retirement has done a real service to Malaya, and his name, like that of his predecessor, Mr. H. N. Ridley, will live long in the history of Malayan science.

B. B.

Latex in Industry.

R. T. Noble, Ph. D. The Rubber Age (New York), 384 pp. 76 illustrations G$7.

During the last decade investigations on rubber latex and numerous important industrial applications have resulted in a very considerable literature scattered in various journals and patent applications. Two large volumes dealing exclusively with latex have been published during the last three or four years in addition to a special brochure issued by the Rubber Growers' Association. This new publication by Dr. Noble will also be welcomed by all scientific workers and technologists who are concerned with this interesting and valuable product. Dr. Noble is appropriately qualified to be the author, since he has been carrying out investigations with latex with one of the largest Latex Corporations in America and before that was investigating artificial rubber emulsions.

In writing a review of this excellent publication it would be difficult to improve on the encomiums and statements made by Dr. E. A. Hauser in his introduction to the book, especially in view of the fact that Dr. Hauser, as is well known, is one of the world's leading authorities on the subject.

It is unnecessary to deal in detail with any particular aspect of the subject. The book is a *multum in parvo* dealing concisely in Part I with Sources, Preservation and Shipment of Latex, Properties of Latex, Concentration, Artificial and Vulcanized Latex, Compounding, including technique of stabilizing, thickening and wetting, Coagulation of Latex Compositions, Vulcanization and Examination of Latex.

Part II covers technical applications of latex in which various processes are discussed in separate chapters.

An extremely valuable adjunct is the comprehensive bibliography published at the end of each chapter.

This book should be in the possession of all those interested in the production and consumption of latex, in addition to those engaged in scientific investigations on the product.

The producer (planter) will realize, as I am afraid he does not at present, the large amount of important scientific work which is being carried out on his behalf, not only by producers' organizations but by chemists and other technologists engaged in rubber manufactories or by Latex Corporations such as the one in which Dr. Noble is engaged.

The grateful thanks of all latex technologists are due to Dr. Noble for compiling this publication.

The only criticism I have to make is in relation to the weight of the book. For its size, it is I think the heaviest book I have handled, which is due presumably to the use of a heavily loaded art paper for the text as well as for the illustrations. The illustrations, it may be remarked, are excellent.

B. J. E.

Tropical Planting and Gardening.

H. F. Macmillan. Fourth Edition. Published by Macmillan & Co. Ltd., London, 1935. 8vo. 560 pages including glossary and index; 3 coloured plates, 380 half tone and 23 line illustrations. Price 25 shillings.

The appearance of a fourth edition of Macmillan's *Handbook on Tropical Planting and Gardening*, ten years after the previous edition was published, is welcome. The actual number of pages in the present edition is slightly decreased, but the general matter has been added to and revised. An extra chapter is included dealing with suitable plants for, and their cultivation in, Arid or Sub-desert Regions. The illustrations, which are well reproduced, are increased in number and variety.

The book contains thirty-eight chapters which are divided into five sections. Section I deals in a general manner with soils and manures, cultivation, propagation, and the laying-out and upkeep of gardens and grounds in the tropics. A list of leguminous green manures and cover plants is included together with brief descriptions and cultural directions.

Section II is a large one, embracing flowering trees, shrubs, and climbers, herbaceous and other plants, suitable for cultivation at low or medium elevations. The information given, supplemented with numerous illustrations, is of particular interest to the horticulturist. Further chapters are included dealing with ornamental plants and trees for high altitudes, and coastal and dry regions. The chapters on tropical and sub-tropical fruits provide a useful guide to the majority of fruits which may be grown in the East. Chapters XXII to XXIX are concerned with tropical and sub-tropical vegetables and food-crops, spices and condiments. These chapters contain information of considerable value to planters and others in Malaya who may require a reference to little-known crops and trees of economic importance.

The next section (IV) is of general interest to the agriculturist since it includes all crops grown in the eastern tropics. Tea, coffee, cacao, tobacco, coconut and oil palms, rubber, fibres and dye plants, and fodder grass, are all dealt with in

a concise manner. The reference to the oil palm is perhaps the least satisfactory since little advantage has been taken of recent publications. It is unfortunate that the illustration on page 376 of the male inflorescence of the oil palm is inverted. A large number of plants of minor economic importance are dealt with in this section, so that it provides an excellent guide to the lesser-known crops which may be grown in tropical countries. The chapter on Fodder Grasses is a useful one and details similar results to those obtained in Malaya.

Section V is devoted to various perfume-yielding and honey-producing plants known in warm countries. Subsequent chapters deal with pests and diseases likely to occur, with notes on their treatment. The final chapters contain information on the packing of plants for transport and storing seeds. Useful references to recipes for making preserves and weights of various seeds are also given. A comprehensive glossary and an index of fifty-eight pages complete the book.

The new edition of this handbook maintains and enhances the excellence of previous editions and, although written primarily for Ceylon, is suitable for wider application. A considerable reduction in price has been made and it should appeal to many interested in planting and gardening under tropical conditions.

J. N. M.

Departmental.

FROM THE DISTRICTS.

Compiled by the Chief Field Officer from Monthly Reports submitted by Field Officers.

February, 1936.

February was, on the whole, a month of hot dry weather everywhere, but occasional heavy showers in the second half of the month brought the rainfall up to or slightly above the average in the majority of the inland areas. In Kedah there were strong north-east winds and the rainfall was well below normal as it also was on the greater part of the west and east coasts, except in the Dindings where local showers were frequent.

Remarks on Crops.

Padi.—Harvest was continued under ideal weather conditions in all areas where it had been commenced in January. It was begun during the month in most parts of North and Central Perak, in the Sungei Manik area in Lower Perak, in the Panchang Bedena and Tanjong Karang mukims of Kuala Selangor District, and throughout the State of Kelantan.

In Krian the protracted nature of the harvest has prevented any concentrated demand for labour, supplies of which have been ample and have included numerous Malays from Province Wellesley and Penang Island. Moreover, more owners of padi land are themselves reaping their crops this season as a result of propaganda in past years. In Kuala Kangsar District, padi growers in the riverine mukims say that the crop is the best they have obtained for many years, especially in the areas within the new pump irrigation scheme. Further down the river in Lower Perak District, measured plots showed yields of 570 gantangs per acre in Pulau Tiga mukim and 480 gantangs per acre in Kampong Gajah mukim. Yields in the Sungei Manik area have also on the whole been good.

The good crop in the Central District of Malacca has led to considerable exports of padi to Singapore and Johore, while large supplies have also been delivered to the rice mill at Ayer Lileh. In this Settlement a heavy demand for seed of pedigree strains is again anticipated in the coming season.

In Kelantan the wet padi crop is expected to give a good yield.

The premium of 1 cent a gantang promised by the Bagan Serai Mill Board for supplies of unmixed padi of the strain Seraup 48 is being paid out on all consignments certified by the Agricultural Officer, Krian, to be of a reasonable standard of purity. Up to the end of the month one large estate had supplied the mill with 51,425 gantangs of this padi, while small-holders had received the premium on 49,400 gantangs. In all some 2,700 gantangs were rejected as being below the required standard of purity.

A small power-driven rice mill has been installed by a Malay at Lenggong in Negri Sembilan.

Rubber.—The hot dry weather during the month caused simultaneous wintering and rapid defoliation of the rubber trees throughout the Peninsula.

There was a marked increase in the number of holdings left untapped. This was due to several causes. Preoccupation with padi harvest was one important cause; another was that the quarter's supply of export coupons issued in January was becoming exhausted. This in turn led to high prices for coupons, which were saleable at as much as $28 per picul of export rights in Johore, and to as low a price as $3.50 to $4.50 per picul for rubber, mostly unsmoked sheet, without coupons. The high price of coupons rendered their sale at least as profitable as tapping on properties where hired tappers are employed, while tapping without export rights was quite unprofitable, unless the work was done by the landowner or a member of his family. Reduced yields following on the heavy wintering were an additional discouragement to tapping.

A further matter of interest reported during the month was that although the price of rubber increased, the differences between the prices of different grades of sheet diminished, especially that between smoked and unsmoked sheet of fairly good quality. For example, in North Kedah smoked sheet sold at $32.60 per picul while unsmoked sheet fetched $32 per picul. During recent months this difference has usually been at least $1 per picul and usually $2 or more.

In the dry conditions prevailing, mouldy rot disease gave little trouble. Leaf fall due to *Oidium Heveae* was reported from one or two estates in Negri Sembilan, but was not severe. It was, however, somewhat early for the appearance of this disease, as the trees had barely commenced to produce their new flush of leaves.

Copra.—The rise in the price of copra was maintained in the first half of the month, but subsequently declined by some 70 to 80 cents per picul. Even so it remained high enough, at about $5 per picul for f.m.s. quality, to sustain interest in copra production in all the principal coconut-growing areas. Nut prices did not necessarily decline in proportion to those of copra owing to continued shortage of nuts in some localities. Copra-making recommenced in Kelantan, as the change in the weather permitted of successful sun-drying.

The construction of the coastal bund in Sabak Bernam Sub-district, Selangor, is reported to be having the desired effect. Palms along the coast, which had yellow leaves and an unhealthy appearance, are gradually improving both in colour of foliage and yield of nuts.

Fruit.—Supplies of pineapples continued to decrease; consequently prices for fresh fruit remained high and all factories were reduced to working only once in two or three days. The season for tree fruits was drawing to a close, but duku and rambai were harvested in Selangor, Pahang and Johore, while durians were still fruiting in Malacca. Exports of bananas from Negri Sembilan were well maintained, being estimated at some 33,600 piculs for the month.

Agricultural Stations and Padi Test Plots.

Arrangements have been made for extending the area of the Kuala Kangsar Agricultural Station. The additional land was marked out, certain old coconut and other trees were removed and the land levelled.

Certain coffee bushes at this Station, formerly showing yellow foliage believed to be due to nitrogen starvation, were treated with ammonium sulphate. Those so treated showed a marked improvement as compared with the untreated trees used as a control.

During the month rambutans were successfully budded and about 30 per cent. of success was obtained in budding durians. Extra shade was employed to counteract the effect of the hot dry weather and this seemed to be proving effective.

In Johore work was commenced on the site of the new 30 acre Central Experiment Station at Ayer Hitam. Bush growth on the land was slashed and patches of *lalang* grass were dug out.

Padi harvest was concluded at the Telok Chengai Station in Kedah and on several Padi Test Plots, while it was nearing completion on most other Padi Stations and Test Plots. On the Tanjong Karang Test Plot in Kuala Selangor District Radin 2 gave a yield from multiplication plots of over 500 gantangs per acre, which is good for this locality.

At the Central Experiment Station in Kelantan Radin 4, Seraup 15 and Seraup 36 gave yields somewhat exceeding 600 gantangs per acre, while strains of Radin Siak, a 5 month variety, gave 460 to 490 gantangs per acre.

Agricultural Instruction.

Further demonstrations on the use of the Malacca plough and harrow and of the *tajak* for preparing padi land were given in Lipis District of Pahang. These were well attended and many of the cultivators tried the implements for themselves. Up to the present the *tajak* appears to be the most popular of the three implements. Arrangements have been made to supply departmentally all the implements at cost price and a fair demand is expected.

Headmen from the north-west portion of Krian District visited the Titi Serong Padi Station on February 3rd and were reported to be impressed by the large blocks of Seraup 48.

An important demonstration, at which His Highness the State Commissioner, Muar, and the District Officer, Tangkak, were present, was given at the Tangkak Padi Test Plot in Johore to about 150 headmen from Muar, Pontian and Segamat Districts on the 6th February. Apart from the work in progress, the use of the sickle for harvesting, the barrel for threshing and the winnowing machine were demonstrated and the importance of rat control was stressed. There was an enthusiastic response to the invitation to try any implements demonstrated, while the numerous questions asked provided evidence of the interest evinced.

The Rural Lecture Caravan completed its tour in Selangor on the 3rd and commenced a tour in the Batang Padang and Kinta Districts of Perak on the 9th of February. Large crowds attended at most centres, especially at those which were being visited for the first time.

DEPARTMENTAL NOTES.

Visit of Adviser on Agriculture.

The Adviser on Agriculture visited Fraser's Hill from 22nd to 24th February for the purpose of inspecting the activities of the Department at this hill-station.

Agricultural Journal in the Tamil Language.

In response to a request received from the Malayan Estate Owners' Association, the Department has published this month the first number of an agricultural journal in the Tamil language.

The project has been considered on several occasions during the past few years, but for various sufficient reasons, was not put into effect. Its place has been taken, however, by occasional leaflets in Tamil dealing with particular subjects upon which propaganda was desirable.

The present venture is in the nature of an experiment, doubt having been expressed in several quarters regarding the likelihood of such a publication commanding the attention of those for whom it is primarily intended. The Indian owners of large properties are more often than not able to read English and can, therefore, make use of the departmental publications in this language, whereas the labourers are frequently unable to read their own language.

The Tamil Agricultural Journal will be distributed free to *bona fide* agriculturists. The co-operation of employers of labour and of Indian planters is invited to make this publication known amongst the community for which it is intended. Applications for copies should be addressed to the Editor, Department of Agriculture, Kuala Lumpur, and any constructive suggestions or criticisms will be welcome in order that subsequent issues, if any, may achieve a wider utility.

The following are the subjects of articles in the present issue:—Editorial; Gingelly; Soil Erosion—What it is and how it may be guarded against; Manufacture of Smoked Sheet on Small Holdings; the Quality of Copra; White Ants in Coconuts.

Statistical.

MARKET PRICES.

February, 1936.

Major Crops.

Rubber.—The market shewed a considerable and sustained improvement during February. Spot loose opened in Singapore at 24¼ cents per lb., rose steadily to 26 1/16 by the middle of the month, and closed at 25 9/16. The average price for the month for No. 1 X. Rubber Smoked Sheet was 25.38 cents per lb. as compared with 23.41 cents in January. The average price in London was 7.27 pence per lb., and in New York 15.38 cents gold as compared with 6.76 pence and 14.20 cents gold in the previous month.

Table I.

Weekly Prices Paid By Local Dealers for Small-Holders' Rubber, February, 1936.

(Dollars per Picul.)

Grades.	Kuala Pilah, Negri Sembilan.				Kuala Kangsar, Perak.			Batu Pahat, Johore.
	6	13	20	27	5	12	19	
Smoked sheet	30.00	31.80			30.40	32.83	33.77	No Sales
Unsmoked sheet	29.00		31.00	31.00				
Scrap		27.00		27.00				

Transport by F. M. S. R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway $10.00 per ton (minimum consignment 5 tons).

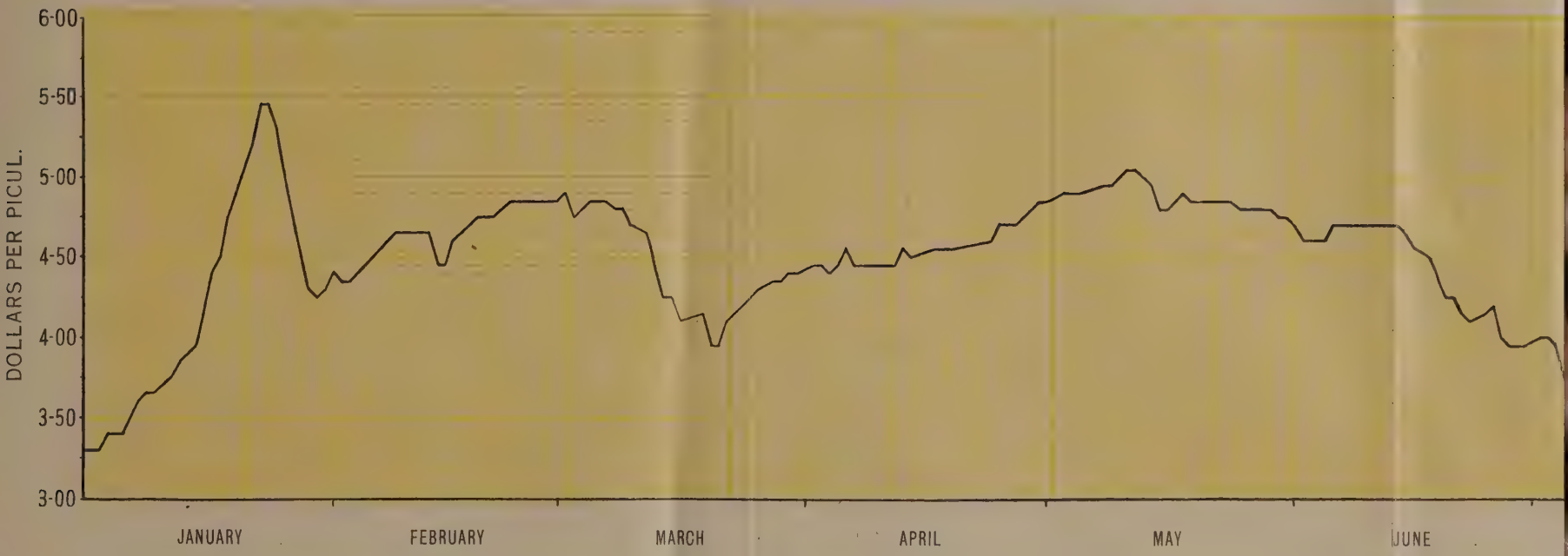
At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

At Kuala Kangsar the standard deduction for moisture in unsmoked sheet is 10 per cent

No purchases at Batu Pahat during the month, and at Kuala Kangsar on the 26th February.

COPRA "SUN

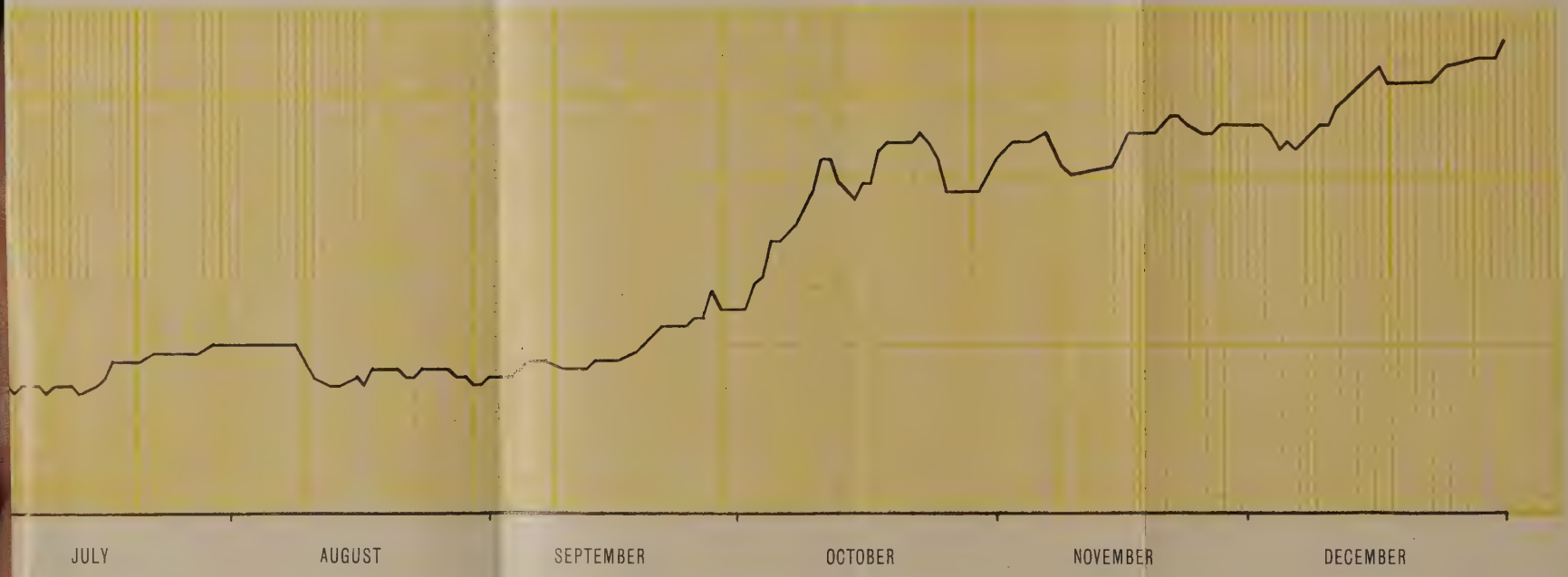
SINGAPORE DAILY MARK



DRIED"

ET PRICES 1935

Supplement to
The Malayan Agricultural Journal, March 1936.



Palm Oil.—Prices quoted during February for the Malayan commodities are given in the following table.

Table II.

Prices of Palm Oil and Palm Kernels.

Date 1936.	Palm Oil in Bulk, c i.f. landed weight Liverpool/ Halifax.	Palm Kernels, c.i.f. landed weight London/ Continent
	per ton	per ton
Feb. 7	21. 0. 0	11. 0. 0
„ 14	21. 10. 0	11. 5. 0
„ 21	21. 0. 0	11. 2. 6

Copra.—Prices weakened throughout February, the month closing on a still falling market. The sun-dried grade opened in Singapore at $6.60 per picul, and fell to $5.15 at the close, the average for the month being $5.68 per picul as compared with $6.08 in January. The mixed quality fell in price also, averaging $5.16 per picul as compared with $5.51 in the previous month.

Copra cake fell to $1.25 per picul at the end of the month, the average price for February being $1.34 per picul as compared with $1.40 in January.

Rice.—The average wholesale prices of rice per picul in Singapore for January were as follows:—Siam No. 2 (ordinary) $3.64, Rangoon No. 1 $3.45, Saigon $3.37, as compared with December corresponding prices of $3.62, $3.57 and $3.32. The January 1935 respective prices were $3.11, $2.90 and $3.02.

The average retail market prices in cents per gantang of No. 2 Siam rice in January were:—Singapore 34, Penang 30, Malacca 26, as compared with 32, 30 and 27 respectively in December.

The average declared trade value of imports of rice in January was $3.64 per picul, as compared with $3.63 in December and $3.66 in November.

Padi.—The Government Rice Mill at Bagan Serai raised the price paid for padi from $1.65 to $1.75 per picul, but lowered it to $1.70 towards the end of the month. Retail prices per gantang ranged from 6 to 14 cents in different parts of the country.

Pineapples.—Prices in Singapore were maintained at the levels recently fixed by the Packers' Combine which are: Cubes $3.45 per case, Sliced Flat $3.25, Sliced Tall $3.35. The January average prices were $3.50, $3.30 and $3.44 respectively.

Prices of fresh fruit per 100 were: Selangor $1.20 to $4; Singapore $1.50 to $3.40; Johore, 1st quality $2 to $5, 2nd quality $1.50 to $3.50, 3rd quality 70 cents to $2.

Beverages.

Tea.—Seven consignments of Malayan tea were sold on the London market during February. One consignment of highland tea averaged 1s. 1d., and the remaining consignments of lowland tea were sold at prices averaging 1s. and 1s. 0¼d. per lb.

Average London prices per lb. during the month for tea consignments from other countries were as follows:—Ceylon 1s. 2.38d., Java 10.77d., Indian Northern 1s. 1.42d., Indian Southern 1s. 0.94d., Sumatra 10.66d.

The latest Colombo average prices available are quoted from the *Weekly Tea Market Report,* 25th February, 1936, of the Colombo Brokers' Association, and are as follows (rupee cents per lb.):—High Grown Teas 95 cents, Medium Grown Teas 68 cents, Low Grown Teas 61 cents.

Coffee.—Sourabaya coffee opened at higher prices than the previous month, weakening in the second half of the month. Opening prices per picul were $14 to $15, falling to $13 to $14. Palembang coffee improved, the range of prices rising from $7 to $8 to $7.50 to $8.50 at the close.

Prices of locally-grown coffee were low, ranging from $11 to $28 per picul.

Spices.

Arecanuts.—Prices in Singapore fell during February. Average prices per picul were:—Splits $4.50 to $6.00; Sliced $7.50 to $8.50; Red Whole $5.06 to $6.12.

The Singapore Chamber of Commerce average prices per picul were:—Best $6.41, Medium $5.89, Mixed $4.82, as compared with $6.52, $6.07 and $4.99 respectively in January.

Pepper.—There is very little business passing, and prices are virtually nominal. They were marked down during February, and average prices per picul for the month were: Singapore Black $8.90, Singapore White $16.30, Muntok White $16.80, as compared with $9.06, $16.88 and $17.38 respectively in January.

Nutmegs.—There was a considerable drop in Singapore prices during February, the monthly averages per picul being: 110's $32 and 80's $32.80, as compared with $35.50 and $36 in January.

Mace.—Prices of this commodity also weakened, Siouw averaging $102 per picul, and Amboina $73, as compared with $105 and $74.50 in January.

Cloves.—Nominal Singapore prices continued unchanged at $37 per picul for both Zanzibar and Amboina.

Cardamoms.—According to the Ceylon Chamber of Commerce weekly reports green cardamoms were quoted during February at Rs. 1 to Rs. 1.22 rising to Rs. 1.15 to Rs. 1.25 at the close.

Miscellaneous.

Tuba Root (*Derris*).—There was a much firmer tone in the Singapore market during February, and, in consequence, prices advanced substantially. The average price of roots sold on rotenone content was $49 per picul, and for roots sold on a basis of ether extract was $31.50. The January average prices were $45 and $28 respectively.

Gambier.—Block remained unchanged at $6.50 per picul, while No. 1 Cube improved to $10.50 per picul as compared with $10 in January.

Tapioca.—There was no change in the Singapore market for this commodity, prices per picul being: Flake Fair $5.50, Seed Pearl $5.50, Medium Pearl $6.50.

Sago.—Prices in Singapore weakened slightly at the close of February, averages for the month being (per picul): Pearl, Small Fair $3.74, Flour, Sarawak Fair, $2.48, as compared with $3.75 and $2.50 in the previous month.

Tobacco.—Prices of locally grown tobacco were very high in Kelantan, being $80 and $50 per picul for 2nd and 3rd quality respectively. The range of prices in other parts of the country was as follows:—1st quality $25 to $68, ($80 in one District of Selangor), 2nd quality $20 to $45, 3rd quality $10 to $30.

The above prices are based on London and Singapore daily quotations for rubber; on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports are kindly supplied by Messrs. Guthrie & Co. Ltd., Kuala Lumpur; the Singapore prices for coffee and arecanuts by the Lianqui Trading Company of Singapore, and tuba prices by Messrs. Mackay & Co., Singapore.

1 picul = 133⅓ lbs. The Dollar is fixed at two shillings and four pence.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Charing Cross. London, S.W.1.

GENERAL RICE SUMMARY.*

January, 1936.

Malaya.—Imports of foreign rice during January were 49,935 tons, and exports 15,709 tons. Net imports were 34,226 tons as compared with 59,928 tons in 1935†.

Of the January imports, 49 per cent. were consigned to Singapore, 15 per cent. to Penang, 9 per cent. to Malacca, 24 per cent. to the Federated Malay States, and 3 per cent. to the Unfederated Malay States. Of the total, 76 per cent. came from Siam, 19 per cent. from Burma, 4 per cent. from French Indo-China, and 1 per cent. from other countries.

Of the exports during January 67 per cent. were consigned to the Netherlands Indies, and 33 per cent. to other countries. The various kinds of rice exported were (in tons, percentages are shewn in brackets): Siam 12,639 (80.5), Burma 2,168 (13.8), French Indo-China 727 (4.6), parboiled 62 (0.4), local production 113 (0.7).

India and Burma.—Foreign exports for the year 1935 totalled 1,637,000 tons, as compared with 1,383,000 in 1934, an increase of 18.4 per cent. Of the 1935 exports 3.7 per cent. were to the United Kingdom, 9.3 per cent. to the Continent of Europe, 26.4 per cent. to Ceylon, 31.2 per cent. to the Straits Settlements and the Far East, and 29.4 to other countries. The corresponding 1934 percentages were 8.2, 17.1, 26.5, 20.5 and 27.7.

Burma's total exports of rice and bran (*Bangkok Times*, 10th February, 1935) from 1st January to 28th December, 1935, were 3,356,717 metric tons, as compared with 3,787,538 metric tons in 1934, a decrease of 11.4 per cent.

Siam.—Exports of rice and rice products from Bangkok during December are provisionally given as 122,466 tons. The total for 1935 was 1,510,585 tons as compared with 1,916,782 tons in the previous year.

Japan.—The yield of the second Formosan crop of 1935 was 672,365 tons, an increase of 30,311 tons (4.7 per cent.) over the corresponding crop of 1934.

French Indo-China.—Entries of padi into Cholon during January were 140,671 metric tons as compared with 158,537 metric tons in 1934, a decrease of 11.3 per cent. Exports of rice were 60,174 as against 135,066 metric tons, a decrease of 55.4 per cent.

Netherlands Indies.—According to *The Netherlands Indies Economic Bulletin*, 1st February 1936, the area under padi harvested during the period January to November 1935 was 7,595,250 acres as compared with 9,013,030 acres in 1934.

Imports of rice into the Netherlands Indies during the same period amounted to 361,857 metric tons as compared with 220,856 metric tons in 1934, an increase of 63.8 per cent.

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* Abridged from the Rice Summary for January, 1936, compiled by the Department of Statistics, Straits Settlements and Federated Malay States.

† It is to be understood throughout the summary that all comparisons and percentage increases or decreases are in relation to the corresponding period of 1935.

Ceylon.—Imports during January were 53,617 tons as compared with 46,510 tons in 1935, an increase of 15.3 per cent.

Of these, 6.5 per cent. were from British India, 69.5 per cent. from Burma, nil from the Straits Settlements, and 24 per cent. from other countries. The corresponding percentages for 1934 were 11.1, 75, 1.6, and 12.3.

Europe and America.—Shipments to Europe from the East during 1935 totalled 827,236 tons, a decrease of 32.3 per cent. when compared with the 1934 total of 1,222,473 tons. Of the 1935 shipments 39.4 per cent. were from Burma, 2.9 per cent. from Japan, 50.5 per cent. from Saigon, 5.9 per cent. from Siam, and 1.3 per cent. from Bengal. The corresponding percentages for 1934 were 32.2, 3.8, 52.7, 9.6 and 1.7.

Shipments for Cuba, West Indies, and America from 1st January to 13th December totalled 268,378 tons, as compared with 198,196 tons in 1934, an increase of 35.4 per cent.

ACREAGES OF TAPPABLE RUBBER NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST JANUARY, 1936.

STATE OR TERRITORY	Acreage of Tappable Rubber end 1934	ESTATES WHICH HAVE ENTIRELY CEASED TAPPING		ESTATES WHICH HAVE PARTLY CEASED TAPPING (*a*)		AREA OF TAPPABLE RUBBER NEVER BEEN TAPPED		Total (3) + (5)	Percentage of (9) to (2)
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
STRAITS SETTLEMENTS :—									
Province Wellesley	44,691	410	0.9	15,560	34.8	655	1.5	15,970	35.7
Malacca	123,793	1,367	1.1	31,221	25.2	3,419	2.8	32,588	26.3
Penang Island	2,593	—	—	469	18.1	254	9.8	469	18.1
Singapore Island	33,312	3,633	10.9	9,247	27.8	462	1.4	12,880	38.7
Total S.S. ...	204,389	5,410	2.7	56,497	27.6	4,790	2.3	61,907	30.3
FEDERATED MALAY STATES :—									
Perak	295,895	10,721	3.6	66,884	22.6	14,527	4.9	77,605	26.2
Selangor	345,100	11,490	3.3	71,063	20.6	15,477	4.5	82,553	23.9
Negri Sembilan	258,381	12,555	4.8	52,910	20.5	17,295	6.7	65,465	25.3
Pahang	75,912	8,974	11.8	27,230	35.9	16,803	22.1	36,204	47.7
Total F.M.S. ...	975,288	43,740	4.5	218,087	22.3	64,102	6.6	261,827	26.8
UNFEDERATED MALAY STATES :—									
Johore	417,633	17,121	4.1	77,018	18.4	59,799	14.3	94,139	22.5
Kedah	199,180	3,880	1.0	22,423	11.3	19,349	9.7	26,303	13.2
Kelantan	28,891	403	1.4	9,475	32.8	4,656	16.1	9,878	34.2
Trengganu (*b*)	4,643	Nil	Nil	15	0.3	179	3.9	15	0.3
Perlis (*c*)	1,206	Nil	Nil	719	59.6	64	5.3	719	59.6
Brunei	(*d*) 4,991	Nil	Nil	1,610	32.3	848	17.0	1,610	32.3
Total U.M.S. ...	656,544	21,404	3.3	111,260	16.9	84,895	12.9	132,664	20.2
TOTAL MALAYA ...	1,836,221	70,554	3.8	385,844	21.0	153,787	8.4	456,398	24.8

Notes :—(*a*) Area out of tapping on Estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.
(*b*) Registered Companies only.
(*c*) Rendered quarterly.
(*d*) Acreage of tappable rubber on 1st May, 1934.

STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF JANUARY, 1936, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January 1936		during the month		January 1936						
	Ports	Dealers	Estates of 100 acres and over	during the month	January 1936	during the month	January 1936	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	January 1936
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	5,337	13,187	10,210	10,210	7,044	7,044	Nil	Nil	Nil	Nil	12,294	3,954	12,294	3,954	...	7,894	11,630	6	6
Johore ...	...	1,632	4,222	4,111	4,111	3,876	3,876	Nil	28	Nil	28	1,929	5,801	1,929	5,801	...	2,384	3,755	...	...
Kedah ...	...	181	3,384	3,379	3,379	505	505	Nil	Nil	Nil	Nil	1,445	2,671	1,445	2,671	...	386	2,947	...	...
Perlis ...	...	7	17	13	13	41	41	Nil	Nil	Nil	Nil	Nil	35	Nil	35	...	25	18	...	...
Kelantan ...	...	212	339	268	268	676	676	Nil	Nil	Nil	Nil	179	620	179	620	...	425	271	...	...
Trengganu ...	...	55	50	167	167	84	84	Nil	Nil	Nil	Nil	Nil	251	Nil	251	...	55	50	...	...
Brunei	...	3	50	53	53	67	67	...	...	...	...	...	118	...	118	...	8	47	...	...
Total Malay States	...	7,427	21,249	18,201	18,201	12,293	12,293	Nil	28	Nil	28	15,847	13,450	15,847	13,450	...	11,177	18,713	6	6
S. SETTLEMENTS :-																				
Malacca ...	...	1,308	1,406	1,113	1,113	754	754	Nil		Nil		2,600		2,600		...	2,331	1,147	...	...
Province Wellesley	...	1,691	610	460	460	242	242	Nil		Nil		8,215		8,215		...	1,357	499	...	...
Penang ...	2,250	5,925	9	18	18	41	41	2,544	12,387	2,544	12,387		Nil		Nil	2,246	6,138	11	...	...
Singapore ...	3,669	16,460	160	158	158	37	37	9,936		9,936		12,439		12,439		4,071	18,740	170	22	22
Labuan	...	39	Nil	Nil	Nil	12	12	102		102		Nil		Nil		...	13	Nil	...	...
Total Straits Settlements	5,919	25,423	2,185	1,749	1,749	1,086	1,086	12,582	12,387	12,582	12,387	23,254	Nil	23,254	Nil	6,317	28,579	1,827	22	22
TOTAL MALAYA	5,919	32,850	23,434	19,950	19,950	13,379	13,379	12,582	12,415	12,582	12,415	39,101	13,450	39,101	13,450	6,317	39,756	20,545	28	28

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Province We'sly D'dings M'cca.	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	6,859	17,897	5,909	3,339	2,076	254
WET RUBBER	1,035	843	229	370	308	132
TOTAL ...	7,894	18,740	6,138	3,709	2,384	386

TABLE III
FOREIGN EXPORTS

PORTS	For month	January 1936
29	30	31
Singapore ...	22,255	22,255
Penang ...	11,237	11,237
Port Swettenham.	5,466	5,466
Malacca ...	143	143
MALAYA ...	39,101	39,101

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	January 1936
32	33	34
Malay States ...	29,297	29,297
Straits Settlements	2,588	2,588
MALAYA ...	31,885	31,885

Notes :—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained.
2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month. + Consumption, *i. e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Column (33) and (35) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication, therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S. and F.M.S., at Singapore on 25 February, 1936.

METEOROLOGICAL SUMMARY, MALAYA, JANUARY, 1936.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes						Total.		Most in a day.	Number of days.					Total.	Daily Mean.	Per cent.
	A. Max.	B. Min.	Mean of A and B.	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						Hrs.	Hrs.	
Railway Hill, Kuala Lumpur, Selangor ...	88.6	71.9	80.3	93	70	84	73	83.2	84.0	5.77	146.6	2.03	20	17		5		123.10	3.97	33
Bukit Jeram, Selangor ...	86.6	71.9	79.3	90	69	81	74	82.0	84.4	10.34	262.6	4.00	19	12	1	1		160.10	5.16	43
Sitiawan, Perak ...	87.7	72.7	80.2	91	71	83	75	82.6	83.3	4.95	125.7	1.15	13	10	3			196.15	6.00	51
Temerloh, Pahang ...	84.2	71.8	78.0	89	70	78	73	82.0	83.9	8.45	214.6	1.79	19	15		2		109.30	3.53	30
Kuala Lipis, Pahang ...	84.4	70.6	77.5	91	68	76	73	81.1	82.4	14.44	366.8	3.26	25	19	1	12		119.20	3.85	32
Kuala Pahang, Pahang ...	82.0	73.5	77.7	86	71	77	78	79.3	81.6	25.75	654.1	6.14	24	23				117.85	3.80	32
Kallang Aerodrome, S'pore ...	85.2	74.5	79.9	89	72	77	77	80.3	81.9	6.22	158.0	1.32	19	14				133.30	4.30	35
Butterworth, Province Wellesley ...	86.5	72.8	79.7	89	70	79	75	83.9	84.8	7.40	188.0	1.93	14	10	1			210.35	6.79	57
Bayan Lepas Aerodrome, Penang ...	86.8	73.6	80.2	90	71	79	77	82.6	83.3	4.76	120.9	1.47	17	10	1			208.15	6.71	57
Bukit China, Malacca ...	85.0	73.0	79.0	90	71	79	75	81.0	82.2	3.07	78.0	0.97	12	8				153.15	4.94	41
Kluang, Johore ...	85.1	71.2	78.1	90	69	'73	73	79.9	81.0	5.94	150.9	1.96	15	12	1	6		122.95	3.97	33
Bukit Lalang, Mersing, Johore	81.8	72.3	77.1	85	70	77	75	78.6	79.4	21.80	553.7	6.31	22	20			2	132.55	4.27	35
Alor Star, Kedah ...	87.5	71.0	79.3	91	67	81	74	82.9	84.5	3.43	87.1	0.67	15	14	4	1		197.40	6.37	54
Kota Bahru, Kelantan ...	84.1	72.5	78.3	86	70	78	76	80.6	82.5	18.55	471.2	8.30	21	16		1	1	136.10	4.39	37
Kuala Trengganu, Trengganu	82.9	72.3	77.6	88	70	77	75	79.3	80.6	18.94	481.1	8.75	22	20			1	116.80	3.77	32
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft.	69.2	61.0	65.1	74	59	64	63	70.2	71.0	14.25	362.0	3.08	26	22		23		73.40	2.37	20
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	70.9	57.6	64.3	75	50	66	62	68.5	68.9	8.73	221.7	1.80	23	21				88.90	2.87	24
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	69.8	58.5	64.1	74	55	63	60			9.36	237.7	2.04	24	23				98.10	3.61	27

Compiled from Returns supplied by the Meteorological Branch, Malaya